

### **REMARKS**

This is a timely response to the Office Action of September 11, 2002. The above-identified patent application has been amended and reconsideration and reexamination are hereby requested.

#### **Amended Claims**

Claim 9 has been amended to replace "electric" with --electrical-- in line 11 of the claim to correct the obvious typographical error. Claim 9 has been further amended to add "wherein said electric field propagates in a direction substantially perpendicular to the direction of propagation of the laser light" to further distinguish Claim 9 from the cited prior art, as described below. Support for the amendment to Claim 9 may be found in Claim 1, as originally filed. Therefore, the Applicant submits that the amendment to Claim 9 adds no new matter to the application and may be properly entered.

#### **New Claims**

New independent Claims 24 and new dependent Claims 25 - 26 have been added to the application. Claim 24 has been added to the application to more broadly claim the subject matter which the Applicant considers to be the invention. Support for new Claim 24 may be found in Claim 18 as originally filed. Support for new Claim 25 may be found at page 12, lines 5 - 16. Support for new Claim 26 may be found at page 12, lines 16 - 18. Therefore, the Applicant submits that new Claims 24 - 26 add no new matter to the application and may be properly entered.

With the new claims, Claims 1 - 26 are in the application. The application now comprises four (4) independent claims and twenty-six (26) total claims. The excess claim fees have been calculated as shown on the enclosed Excess Claim Fee paper.

#### **Drawing Objections**

In the Office Action, the Examiner objects to the drawings under 37 C.F.R. 1.84(p)(5). Specifically, the Examiner asserts that the reference character "365" shown in Fig. 3 is not mentioned in the description. A revised drawing of Fig. 3 has been submitted to the Official Draftsperson for entry in the application. The Applicant proposes that the reference character

“365” be deleted from Fig. 3. With the entry of the proposed amendment to Fig. 3, the Applicant submits that the Examiner’s objection to Fig. 3 will be overcome.

The Examiner also objects to Fig. 2 for the failure to include the legend --Prior Art-- to indicate that which is old is illustrated. A revised drawing of Fig. 2 contained the legend --Prior Art-- has been submitted to the Official Draftsperson for entry in the application. With the entry of the proposed amendment to Fig. 2, the Applicant submits that the Examiner’s objection to Fig. 2 will be overcome.

### **Claim Rejections - 35 U.S.C. § 112**

The Examiner rejects Claim 20 under 35 U.S.C. § 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor had possession of the claimed invention. Specifically, the Examiner asserts that there is no discussion in the specification of the open circuit claimed in Claim 20. Therefore, the Examiner appears to assert that Claim 20 does not satisfy the written description requirements of 35 U.S.C. § 112, first paragraph. The Applicant respectfully disagrees.

The Examiner is reminded that “a description is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption.” MPEP 2163.III.A. Further, “the examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an applicant’s disclosure a description of the invention defined by the claims.” MPEP 2163.III.A. Further, “the subject matter of the claim need not be literally described (i.e. using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement.” MPEP 2163.02. For a rejection based on a lack of written description, the Examiner must “provide reasons why a person skilled in the art at the time the application was filed would not have recognized that the inventor was in possession of the invention as claimed in view of the disclosure of the application as filed.” MPEP 2163.III.A.

The Examiner notes that the specification “does mention that the electrode may stop at the edge of the laser and not be connected to an external impedance.” The Examiner further states that “this is not the same thing as showing an open circuit.” The Applicant submits that the proper inquiry under a 35 U.S.C. § 112, first paragraph, rejection is not whether the specification

literally shows a claimed element, but whether one skilled in the art would recognize that the inventor was in possession of the invention as claimed in the rejected claim in view of the disclosure. Clearly, one skilled in the art would understand the lack of a connection to an external impedance as disclosing an open circuit.

As noted above, there is no requirement that the claimed subject matter be literally described in the specification. Therefore, the recitation that “the electrode 420 . . . is not terminated by the external impedance 426” (page 11, lines 29 - 30) is sufficient to disclose “the traveling wave structure is terminated by an open circuit” as claimed in Claim 20. That is, one skilled in the art would understand that the lack of a termination by an external impedance teaches termination by an open circuit. If the Examiner asserts that the lack of termination by an external impedance would not be understood by one skilled to teach termination by an open circuit, the Examiner is respectfully requested to provide a basis for that conclusion. Otherwise, the Applicant respectfully request that the rejection of Claim 20 under 35 U.S.C. § 112, first paragraph, be withdrawn.

The Examiner rejects Claims 9 - 17 under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserts that the recitation of “the electrical signal” in line 9 of Claim 9 lacks antecedent basis. The Applicant points out that the preamble of Claim 9 recites “a method for frequency modulating a laser light signal with an electrical signal . . . .” (Underlining added for emphasis). Therefore, the antecedent basis for the recitation of “the electrical signal” at line 9 of Claim 9 is provided by the recitation of “an electrical signal” in the preamble. Therefore, the Applicant respectfully request that the rejection of Claims 9 - 17 under 35 U.S.C. § 112, second paragraph, be withdrawn.

#### **Claims Rejections - 35 U.S.C. § 102**

The Examiner rejects Claims 1 - 6, 9 - 11 and 13 under 35 U.S.C. §102(b) as being anticipated by Gorfinkel et al. (U.S. 5,311,526). The Examiner is reminded that “a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP 2131 quoting *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987) (underlining added for emphasis). Further, for Gorfinkel to be an anticipatory reference, “there must be no difference between the claimed invention and the reference disclosure, as viewed by one of ordinary skill in the field of the

invention.” *Scripps Clinic & Research Found. v. Genentech, Inc.*, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991). The Applicant asserts that the Examiner has not shown how Gorfinkel teaches each and every element as set forth in Claims 1 - 6, 9 - 11 and 13.

#### Claim 1

The Examiner asserts that Gorfinkel discloses “said electric field propagating in a direction substantially perpendicular to the direction of propagation of laser light within the laser cavity” as recited in Claim 1. However, the Examiner has not provided any citation to Gorfinkel, either by column and line number or reference character number, where Gorfinkel allegedly makes this specific teaching. Therefore, the Applicant submits that the Examiner has not established a *prima facie* case for anticipation of Claim 1, since the Examiner has not shown how Gorfinkel teaches each and every element of Claim 1.

Further, the Applicant submits that Gorfinkel does not teach “said electric field propagating in a direction substantially perpendicular to the direction of propagation of laser light within the laser cavity” as recited in Claim 1. Gorfinkel describes, in part, a semiconductor laser in which a core region 23 and cladding regions 21, 22 are disposed between contact layers 24, 25. The contact layers 24, 25 (essentially electrodes) apply an electric field across the laser cavity. However, the electrodes, as disclosed by Gorfinkel, are essentially those of a lumped-element capacitor, such that the voltage everywhere across the capacitor is the same. If the voltage everywhere across the electrodes is the same, there is no “electric field propagating in a direction substantially perpendicular to the direction of propagation of laser light” as claimed in Claim 1.

Therefore, the Applicant submits that Gorfinkel does not teach, disclose, or suggest each and every element as recited in Claim 1. Therefore, the Applicant submits that Claim 1 is patentable over Gorfinkel.

#### Claim 2

The Applicant submits that Claim 2 is patentable over Gorfinkel at least based upon its dependence on Claim 1. The Applicant further submits that Claim 2 is patentable based on its own merits. Specifically, Claim 2 recites, in part, “wherein said means for applying an electric field comprises a traveling-wave structure.” The Examiner appears to assert that electrodes 24,

25 of Gorfinkel comprise a traveling-wave structure as recited in Claim 2. The Applicant submits that Gorfinkel makes no such disclosure.

As discussed above, Gorfinkel merely discloses a lumped capacitance that, at best, provides the capability for applying a uniform voltage across the laser cavity of Gorfinkel. However, to one skilled in the art, a traveling wave structure differs from a lumped capacitance. By way of explanation, but not of limitation, the Applicant notes that the present specification describes a traveling wave structure as providing a planar wavefront across the entire structure. See page 12, lines 11 - 12. Clearly, the electrodes of Gorfinkel do not provide a planar wavefront. Hence, the Applicant submits that Gorfinkel does not teach, disclose, or suggest each and every element as claimed in Claim 2, and, therefore, Claim 2 is patentable over Gorfinkel.

#### Claims 3 - 6

The Applicant submits that Claims 3 - 6 are patentable over Gorfinkel at least based upon their direct or indirect dependence on allowable base claims.

#### Claim 9

The Applicant submits that Claim 9, as amended, is patentable over Gorfinkel for the same reasons presented above for Claim 1. That is, the Applicant submits that Gorfinkel does not teach, describe, or suggest "wherein said electric field propagates in a direction substantially perpendicular to the direction of propagation of the laser light" as recited in Claim 9, as amended.

#### Claims 10, 11 and 13

The Applicant submits that Claims 10, 11 and 13 are patentable over Gorfinkel at least based upon their direct or indirect dependence on allowable base claims.

#### **Claims Rejections - 35 U.S.C. § 103**

The Examiner rejects Claims 7, 8, 12, 14 - 18 and 20 - 23 under 35 U.S.C. 103(a) as being unpatentable over Gorfinkel. The Applicant respectfully submits that Gorfinkel does not teach, disclose or suggest all of the claim limitations of the rejected claims. Therefore, the Applicants submit that a *prima facie* case of obviousness has not been established, and Claims 7, 8, 12, 14 - 18 and 20 - 23 are allowable over Gorfinkel.

Claim 7

The Applicant submits that Claim 7 is patentable over Gorfinkel at least based upon its indirect dependence on allowable Claim 1.

Claim 8

The Applicant submits that Claim 8 is patentable over Gorfinkel at least based upon its direct dependence on allowable Claim 1.

Claim 12

The Applicant submits that Claim 12 is patentable over Gorfinkel at least based upon its indirect dependence on allowable Claim 9.

Claim 14

The Applicant submits that Claim 14 is patentable over Gorfinkel at least based upon its indirect dependence on allowable Claim 9.

Claim 15

The Applicant submits that Claim 15 is patentable over Gorfinkel at least based upon its direct dependence on allowable Claim 9. The Applicant further submits that Claim 15 is allowable based upon its own merits. As discussed above for Claim 2, the Applicant submits that Gorfinkel does not teach, describe, or suggest a "traveling wave structure" as recited in Claim 15.

Further, the Examiner states that it would have been obvious to one skilled in the art to use RF excitation in Gorfinkel's laser because "RF excitation is superior as far as chemical stability and optical quality of the lasing medium" To those skilled in the art, "chemical stability and optical quality of the lasing medium" are known to be issues that are relevant to the static operation of gas lasers (such as those disclosed in U.S. Patent No. 5,602,865, issued to Laakmann). However, Gorfinkel discloses a solid-state laser. Therefore, why would the chemical stability and optical quality of the solid-state lasing medium of Gorfinkel be of concern to one skilled in the art?

Therefore, the Applicant submits that Claim 15 is patentable over Gorfinkel.

Claim 16

The Applicant submits that Claim 16 is patentable over Gorfinkel at least based upon its direct dependence on allowable Claim 15 or indirect dependence on Claim 9.

Claim 17

The Applicant submits that Claim 17 is patentable over Gorfinkel at least based upon its direct dependence on allowable Claim 9.

Claim 18

The Applicant submits that Claim 18 is allowable over Gorfinkel for the same reasons set forth above for both Claims 1 and 2. That is, the Applicant submits that Gorfinkel does not teach disclose, or suggest "a traveling wave structure" as recited in Claim 18. The Applicant further submits that Gorfinkel does not teach, disclose, or suggest "the radio frequency field propagating in the traveling wave structure in a direction substantially perpendicular to the direction of laser light" as recited in Claim 18. As discussed above for Claim 1, Gorfinkel does not disclose a direction for propagation for an electric field, since the electrodes of Gorfinkel are configured to apply the same voltage at the same time at every place on the electrodes.

Therefore, the Applicant submits that Claim 18 is patentable over Gorfinkel.

Claims 20 - 23

The Applicant submits that Claims 20 - 23 are patentable over Gorfinkel at least based upon their direct dependence on allowable Claim 18.

Claim 19

The Examiner rejects Claim 19 under 35 U.S.C. 103(a) as being unpatentable over the combination of Gorfinkel with Laakmann. The Applicant submits that Claim 19 is patentable over Gorfinkel with Laakmann at least based upon its dependent on allowable Claim 18. The Applicant further submits that Claim 19 is patentable based on its own merits.

The Applicant submits that one skilled in the art would not be motivated by the teachings of Gorfinkel, the teachings of Laakmann, or knowledge available to those skilled in the art to

combine Gorfinkel and Laakmann in the manner done by the Examiner. The Examiner concedes that Gorfinkel does not teach "wherein the traveling wave structure is terminated by an external impedance device" as recited in Claim 19. However, the Examiner asserts that it would have been obvious to "include such an external impedance because it improves the efficiency and stability of the laser, as taught by Laakmann." However, Laakmann is directed at radio frequency excited gas lasers (see Laakmann, col. 1, lines 4 - 5), while Gorfinkel is directed at a semiconductor laser (See Gorfinkel, col. 1, lines 9 - 10).

The Applicant submits there is no motivation to combine the references in the manner done by the Examiner, other than a motivation based upon the disclosure of the present application. While both Gorfinkel and Laakmann discuss lasers, the references discuss lasers that use completely different lasing media. Hence, one skilled in the art would not be motivated to look at the art of gas lasers, when looking to modify or improve the operation of a semiconductor laser. The Applicant submits that the Examiner has relied upon impermissible hindsight to combine the teachings of the two references to arrive at the subject matter claimed in Claim 19. Therefore, the Applicant submits that Claim 19 is allowable over the cited references and the rejection of Claim 19 based upon the combination of Gorfinkel with Laakmann should be withdrawn.

#### **Patentability of New Claims**

The Applicant submits that new Claims 24 - 26 are patentable over the cited prior art for at least the reasons presented above for Claims 1 and 2.

#### **Conclusion**

Hence, the Applicant respectfully submits that all claims of the application, as amended or added, are patentable over the cited references. In view of the above, reconsideration and allowance of the pending claims are respectfully solicited.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.




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(Name of Person Transmitting)

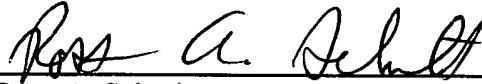


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Respectfully submitted,



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MARKED CLAIMS TO SHOW CHANGES MADE

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9. (Amended) A method for frequency modulating a laser light signal with an electrical signal, said method comprising the steps of:
- providing a laser cavity with a length and width, the laser cavity providing a lasing condition;
  - producing laser light within the laser cavity, the laser light propagating in a direction substantially parallel to the length dimension of the laser cavity;
  - maintaining the lasing condition with energy applied to a gain medium within said laser cavity;
  - applying the electrical signal to said laser cavity to produce an electric field uniformly and simultaneously changing the index of refraction along the length of the laser cavity in proportion to the amplitude of the [electric] electrical signal; and
  - transmitting the laser light out of the laser cavity to provide a frequency-modulated laser light signal
- wherein said electric field propagates in a direction substantially perpendicular to the direction of propagation of the laser light.